Valid from 2026.HS

Module description: Operations Research

Module Code	t.BA.YVW.OR.26HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IDP
Module Coordinator	Peter Fusek
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 2a 4 consecutive lecture lessons per semester week and class
Module Description	The Operations Research module introduces students to Linear and Integer Linear Optimization. The basics of optimization in graphs are presented in the second part of the module..
Module Content	**Linear Optimization:** • Basics and geometrical aspects • Simplex algorithm • Several classic linear optimization models • Introduction to duality theory **Integer Linear Optimization:** • Basics, importance and complexity • Solution approaches: Branch and Bound, Cutting Planes • Several classic integer linear optimization models **Optimization in Graphs:** • Introduction to Graph Theory • Optimal paths • Optimal trees • Optimal cycles (Traveling Salesman Problem)
Prerequisite Knowledge	Basics of Linear Algebra and Analysis

Module description: Operations Research

Learning Objectives (Competences)

Students...	Competencies	Taxonomies
You comprehend specific basic models of the Graph Theory and you can apply them in order to solve practice-oriented optimization problems	F, M	K1, K2, K3
You can create mathematical models of specific practice-oriented problems and formulate them as optimization problems	F, M	K1, K2, K3, K4, K5
You understand models of Integer Linear Optimization, you know solution methods and you are able to apply them	M, F	K1, K2, K3
You comprehend models and methods of Linear Optimization and you are able to apply them to specific problems	M, F	K1, K2, K3

Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
oral exam		30	100	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
-	-	-	-	-

Classroom Attendance Requirement

None

Learning material

- Guenin, B. & Könemann, J. & Tuncel, L. (2014). A Gentle Introduction to Optimization. Cambridge University Press. ISBN 9781107658790.

Comments